REMARKS

The Office Action of July 13, 1994 and the cited art have been carefully considered.

The following comments respond to the Examiner's statements in the corresponding numbered paragraphs of the Office Action.

#16. Claims 1-7, Sec. 112, first paragraph rejection:

a. The Examiner states that "the disclosure is enabling only for claims limited to photosensitive lithographic printing plate precursors and these materials being exposed to light". In our application however, page 2, lines 1-5 read: "Alternatively a lithographic printing plate may be prepared from a **heat mode recording material** as a lithographic printing plate precursor. Upon application of a heat pattern in accordance with image data and optional development the surface of such heat mode recording material may be diferentiated in ink accepting and ink repllant areas.." Page 9, line 32 reads: "having photosensitive layer or a heat mode recording layer", the latter type is further explained on page 10, lines 34-36 "Such heat mode recording layer is a layer containing a substance that is capable of converting light into heat". It is thus clear that the invention is not restricted to photosensitive precursors, nor that the precursor must be exposed to light.

b. The examiner states that "the disclosure is enabling only for claims limited to ... the use of a support for the [photo]sensitive layer, since these materials are not taught to be self-supporting." It is however

clear for a person skilled in the art that such a sensitive layer is supported by the material comprised in the body of what is called in th art "a lithographic printing plate". The precursor comprises this mat rial, because the precursor is exposed and optionally developed to give a printing plate. Page 9, last paragraph reads: "A first type of non-sheet DTR material comprises on a support in the order given a silver halide emulstion layer ..."; page 10 lines 19-21 read: "The second type of mono-sheet DTR material also suitable for use in connection with the present invention comprises on a roughened and anodized aluminum suport in the order given an image receiving layer..."; page 10, last paragraph reads: "An other type of imaging element suitable for use in connection with the present invention is one comprising on a support having a hydrophillic surface ... a photosensitive layer ...".

#17. Claims 1-7, Sec. 112, second paragraph, rejection:

The meaning of exposing is clearly defined in the description, as to comprise exposing to heat (page 2, line 2) "caused by a direct heating source such as a thermal head" (page 2, lines 5-6) or to light "by a light source as e.g. a laser" (page 2, lines 6-7). As such, depending on the type of sensitive material used for the precursor, the sensitive material on the precursor can be exposed to e.g. light or heat. As is clear from the description, also sensitive materials that convert light to heat can be used to apply the method of our invention (page 2, lines 7-12 and page 11, third paragraph).

#18-19. Claims 1-6, Sec. 101 rejection:

First of all it must be clear that "image-wise exposing" is a generic term, which comprises "scan-wise exposing". Next, the copending application Serial No. 08/227,073 contains a restriction not mentioned by the Examiner, namely ... Having a flexible support carrying a surface..." in line 6 of the first claim.

#20-21. Provisional rejection of claims 1-6 under the judicially created doctrine:

Applicants will file a timely terminal disclaimer in compliance with 37 C.F.R. 1.321(b). Both applications are commonly owned.

#22-23. Claims 1, 4 and 6, Sec. 103 rejection:

Stoffel et al (1981) give an overview of printing techniques - "plasma display panels, laser, xerography, lithography, or ink het printers". (page 1898, I. Introduction, second paragraph) - together with an indepth study of various "continuous tone pictorial reproduction" techniques (page 1901, title V,) such as:

A. Globally Fixed Level Thresholding (p. 1901)

B. Locally Adaptive Thresholding (p. 1902)

C. Orthographic Tone Scale Creation (p. 1903)

D. Electronic Screening (p. 1904)

E. Pseudorandom Threshonding, Ordered Dither (p. 1905)

F. **"Error-Diffusion"** Techniques (P. 1907)

Apart from the fact that "lithography" is a general term, that covers

i.e. "computer-to-plate" techniques (see application page 3, last 3 lines) to which the present invention is directed, being a technique that was barely known at the time Stoffel's article was published, lithography in combination with frequency modulation screening is a new and inventive, non-obvious sel c-tion from Stoffel's article, in view of the today's state of the art of direct-to-plate lithography.

A specific advantage of the method according to applicants' invention is the absence of the need to apply expensive Direct Digital Proofing (DDP page 4, lines 4-5). By using frequency modulation, the appearance of moire patterns, color shifts and dot growth (page 3, lines 20-21) are eliminated or dramatically reduced, such that the halftoning process cannot influence the color balance or introduce disturbing density variations or specific patterns. This specific advantage - created by using frequency modulation halftoning to avoid sophisticated and expensive DDP - is an unexpected result, which cannot be deduced from the advantages recited in the Stoffel's article.

On page 1899, under "B. Summary", second paragraph, Stoffel et al, state "Although lithography, xerography, etc. have different microstructural characteristics, the algorithms investigated below are compatible in varying degree with all of them. The optimization of the algorithms for the different marking processes, however, will not be reviewed". On page 1907, the penultimate paragraph states: "In terms of printability, error diffusion techniques often result in relatively isolated and very unconstrained microstructural detail. As with ordered dither, such detail imposes repeatability requirements on the marking process to avoid tone scale errors throughout the range". These

citations rather point away from the use of error diffusion techniques for lithographic printing, because the microstructural detail in this printing technique is of a considerably finer order than for plasma display panels, xerography and ink jet printing. It is therefore that "Virtually all mass-produced (magazines, newspapers, etc.) printed pictorial imagery is produced via this [=electronic screening, predominantly the electronic equivalent of the photomechanical/autotypical process] technique today". (page 1905, just before penultimate paragraph). Such a hint to lithographic printing is not found in section F. "Error Diffusion" Techniques (p. 1907). Table I on page 1909 mentions for "error diffusion" a "non-trivial control of TRC" - Table II even states "No TRC control" - which is of utmost importance in high quality lithographic printing, and further emphasizes "no constraint on the output microstructure and hence demands reliable isolated pixel printing", which is known to be a problem in high resolution lithographic printing. In Photographic Science and Engineering, Volume 22, Number 2, March/April 1978, Jan P. Allebach states in his article "Random Nucleated Halftone Screen" at page 89 in the second paragraph under the Introduction that: "random grain screens have been used to eliminate such artifacts but the binary images that result are very grainy and are difficult to print", and refers to J.W. Wesner, "Screen Patterns Used in Reproduction of Continuous-Tone Graphics" Appl. Opt. 13: 1703-1710 (1974).

Stoffel, et al further marks in table I under processing complexity that preferentially a "twelve pixel context" with "weighted average computation" must be processed for every pixel or micro dot to be rendered on the reproduc-

tion medium. The last line in the first column of page 1908 reads: "The result is a context of 12 pixels (3 scanlines), and an equivalent number of additions". For use in lithography, where the number of scanlines and pixels per scanline is relatively high, the processing of twelve additions per pixel is unacceptable high, and objectionable for a man skilled in the art.

On page 1915, the sentence before the last paragraph says: "Therefor , no simple control is provided to assure printability for any region of the tone scale" further discouraging the use of error diffusion techniques by the man skilled in the art pursuing high quality lithographic printing.

For the above reasons, error diffusion techniques were in the past barely explored in lithographic printing processes in general. When computer-to-plate lithographic printing arrived, and due to the hight quality requirements, impaired by the traditional electronic autotypical screening processes used, the need arose to develop expensive DDP (Direct Digital Proofing page 4, lines 4-5 in the application) systems. If it would have been obvious to select frequency modulation screening - from among all screening techniques as decribed in the Stoffel's reference - to avoid the need of this type of proofing, these expensive and sophisticated DDP systems would not have been manufactured, marketed and used. Moreover, the Stoffel's reference gives no hint that such type of proofing can be avoided by the application of error diffusion techniques, nor could it have been derived from the benefits given in the Stoffel's reference. By scanning through all combinations of the printing techniques recited by Stoffel, combined with the screening techniques explored in the article, one could have selected the combination, but the man skilled

in the art would not have kept this selection, based on the drawbacks cited in Stoffel's article.

#24. Claims 1-3, Sec. 103 rejection:

As submitted above, it would not be obvious to one skilled in the art to include frequency modulation screening techniques such as error diffusion taught by Stoffel, et al (1981) in the techniques of producing printing plates disclosed by either Saikawa et al '811 or Monbaliu et al '156.

Moreover, a person skilled in the art would not incorporate Peano curves in the halftoning process, merely because Conte et al teaches image block sampling for digital signal coding, suited for transmission and/or storage purposes. Efficient coding is achieved by the use of "space filling curves" (column 4, lines 22-25). Nothing in the Conte patent points to halftoning. What is achieved by applicants' invention is not efficiency of scanning, but rather a specific diffusion of the error in halftoning the image. The present invention and the Conte references cover different technical fields and solve different problems, occasionally by using the same curve, albeit probably at a different scale.

#25. Claims 1 and 2, Sec. 103 rejection:

The comments under the first paragraph of 24 above apply. Moreover, the Examiner states on top of page 7 that "Zeevi, et al '014 teaches that either a Peano or Hilbert pattern are useful in compressing information and establish pattern features without the scanning redundancy of raster type scanning". The field of image compression is clearly different from the field of halfton-

ing. It is also a property of most pleasing visual images that they exhibit redundancy. In column 5, lines 46-47, Zeevi recites the acquisition technique operable to eliminate redundant scanning "for applications such as target location, pattern analysis and video data compression", fields well different from halftoning.

#26. Claims 1, 4 and 5, Sec. 103 rejection:

The comments under paragraph 23 apply.

#27. Claims 1, 4 and 5, Sec. 103 rejection:

Bowers et al disclose a refinement to the error diffusion process, in images reproduced by digital halftone printing. The patent gives no lead to lithography. On the contrary, column 1, lines 27-33 say : "Although conventional lithography printing can produce excellent results, the processes involve economies-to-scale and are relatively expensive for short production run. Digital halftone printing in contrast to conventional halftone printing is better suited for shorter production runs". Although not explicitly defined in the text, it is believed that "conventional halftone printing" corresponds to offset printing, lithography, etc. while "digital halftone printing" corresponds to xerography, ink jet printing and the like, which directly print the reproduction on the final sheet. This can also be derived from Fig. 1 and column 4, lines 1-3 "Then the processed images are provided to digital printer 9 for printing onto a sheet 15 by techniques of conventional digital halftone printing". Thus, Bowers, et al contains no suggestion of a combination with Peterson.

#28. Claims 1, 4, 6 and 7, Sec. 103 rejection:

For the same r asons as under paragraph 27, there is no suggestion in Bowers et al to combine with either Saikawa et al '811 or Monbaliu et al '156.

Reconsideration and allowance of claims 1-7 are respectfully requested.

Respectfully submitted,

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